Hallam, Nebraska, Decommissioned Reactor Site

Long-Term Surveillance and Maintenance Program

U.S. Department of Energy
Grand Junction Office

FACT SHEET

The Grand Junction Office has provided cost-effective and efficient stewardship for more than 10 years

Overview

During the mid-1960s, the Hallam Nuclear Power Facility reactor was built and operated by the U.S. Atomic Energy Comission as part of the Power Demonstration Program. Reactor operations were conducted in cooperation with and on the property of the Nebraska Public Power District. Between 1967 and 1969, the reactor was decommissioned and dismantled, and the radioactive portions of the facility were isolated from the environment. Responsibility for the long-term care of the entombed reactor was transferred from the U.S. Department of Energy (DOE) Chicago Operations Office to the Long-Term Surveillance and Maintenance (LTSM) Program at the DOE Grand Junction Office in 1998.

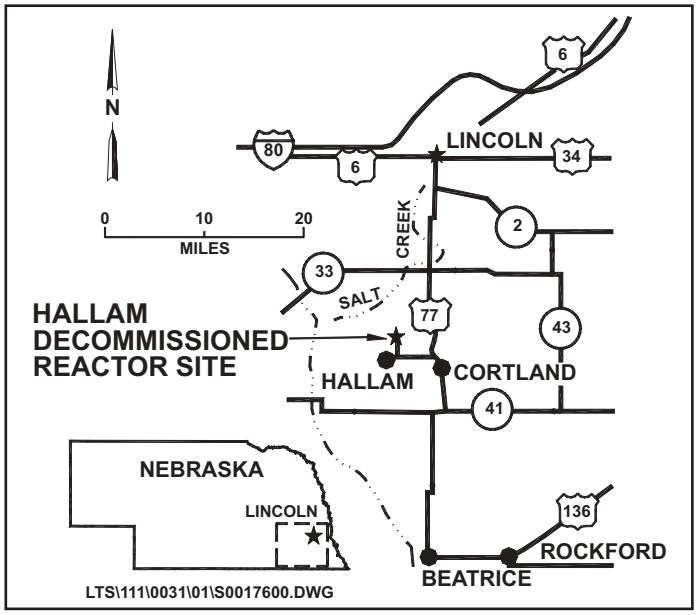
In 1988, DOE established the LTSM Program to provide stewardship of low-level radioactive material disposal sites after completion of environmental restoration activities. The mission of the LTSM Program is to ensure that the disposal systems continue to prevent release of contaminated materials to the environment. These materials will remain potentially hazardous for thousands of years. As long as the encapsulation systems function as designed, risks to human health and the environment are negligible.

The LTSM Program maintains the safety and integrity of the disposal sites through periodic monitoring, inspections, and maintenance; serves as a point of contact for stakeholders; and maintains an information repository for LTSM Program sites at the DOE Grand Junction Office.

Regulatory Setting

The basis for radiological surveillance was established in an agreement between the Nebraska Public Power District and the U.S. Atomic Energy Commission. In addition, the DOE Chicago Operations Office, as the prior site custodian, entered into an agreement with the Nebraska Health Department to install a shallow groundwater monitoring system as part of the environmental surveillance program.

DOE has title to and long-term responsibility for the entombed radioactive materials. LTSM Program activities are structured to protect human health and safety by ensuring compliance with exposure limits established by Title 10 *Code of Federal Regulations* Part 20.



Hallam Decommissioned Reactor Site

The Hallam Decommissioned Reactor Site is in southeastern Nebraska, approximately 19 miles south of Lincoln in Lancaster County. The 18-acre site is located on the 640-acre Sheldon Power Station, a coal-fired power plant owned and operated by the Nebraska Public Power District. Public access to the Hallam Site is controlled by the utility.

The site is situated in a region characterized by thick sections of poorly sorted glacial outwash deposits consisting of clay, silt, sand, and gravel that are covered in places by finer-grain till or loess. These deposits overlie limestone and shale bedrock. Locally, groundwater is about 150 feet beneath the reactor site within the glacial till. Monitoring indicates that local groundwater is not contaminated by the encapsulated radioactive materials.

The Hallam Nuclear Power Facility was a 240-megawatt (thermal) sodium-cooled, graphite-moderated nuclear reactor. It was built and operated by the U.S. Atomic Energy Commission between 1962 and

1964. In 1967, the Nebraska Public Power District was authorized to decommission and dismantle the facility under the Defense Decontamination and Decommissioning Program. Decommissioning was completed in 1969, and the Hallam Nuclear Power Facility was formally retired by the U.S. Atomic Energy Commission in 1971.

The "final" dismantled condition of the Hallam Nuclear Power Facility consists of a massive, below-grade reinforced concrete structure that contained the reactor vessel. All fuel and bulk sodium were removed, and residual sodium was reacted with steam. Radioactive materials were placed in long-term storage vaults that are lined with steel, surrounded by several feet of concrete, and isolated from the remainder of the structure. Access routes into the structure are sealed with welded closures or reinforced expanding concrete. The aboveground portion of the reactor building was razed, and the surface of the remaining structure was weatherproofed by covering it with sand, a waterproof polyvinyl membrane, and soil. This 1.4-acre cover was sloped for positive drainage and drain tiles were installed at the periphery.

The intermediate heat exchanger structure, which protrudes above grade, was weatherproofed with a polyvinyl membrane and a protective cover of concrete to prevent ingress of water to interior portions of the structure.

Human access to the entombed structure can be gained only by extensive effort using a combination of explosives, air hammers, and cutting tools.

Approximately 300,000 curies of radioactive material were entombed in the subterranean reactor building, consisting mostly of neutron activation products dispersed in metal components.

LTSM Program Activities

The LTSM Program conducts annual inspections of this site to evaluate the condition of surface features and determine if any actions are required to maintain site integrity and security. Groundwater sampling and analyses are also conducted on an annual basis. There is currently no evidence of contamination being released from the facility. DOE's responsibility for the safety and integrity of the site will continue indefinitely.

Contacts

For more information about the LTSM Program or about the Hallam Decommissioned Reactor Site, contact

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http://www.gjo.doe.gov/programs/ltsm